

CLAIMS:

1. A coolant union having a primary seal assembly and a tubular carrier member axially movable within a union housing having a wall defining a cylindrical inner chamber and having an annular groove within the housing and adapted to receive fluid coolant and structurally  
5 arranged to direct the coolant through the union and an associated tubular rotor, with the rotor having a sealing member thereon and the axially movable tubular carrier member having a sealing member thereon, with the carrier member axially movable between a pressurized position wherein the sealing members are in contact and an unpressurized position wherein said sealing members are spaced apart from each other, with the coolant union having a secondary seal  
10 assembly including in combination:

a U-shaped seal member positioned in the annular groove within the housing and structurally arranged to provide a seal between the carrier member and the cylindrical inner chamber of the housing when the coolant union is in the operating pressurized condition; and

wherein said U-shaped seal member includes a chamfered portion structurally arranged to  
15 cooperate with a back-up ring member to provide an unfilled volume defined by said chamfered portion to prevent dry-running of said primary seal assembly when the union is operating in the unpressurized condition.

2. The coolant union in accordance with claim 8, wherein said back-up ring is triangular shaped and includes a surface which is structurally arranged to cooperate with said chamfered  
20 surface on said U-shaped seal member.

3. The coolant union in accordance with claim 1, wherein one of the rotating or non-rotating seal members is chamfered.

4. The coolant union in accordance with claim 1, wherein the sealing member mounted to the carrier member is chamfered.

5. The coolant union in accordance with claim 4, wherein the width of said chamfered sealing surface provides a sealing surface of approximately one-half the width of said other sealing surface.

6. A coolant union having a tubular carrier member axially movable within a union housing having a wall defining a cylindrical inner chamber, with the carrier member adapted to receive fluid coolant and structurally arranged to direct the coolant through the union to an associated tubular rotor, with the coolant union having a seal assembly including in combination:

a first seal member presenting an annular sealing surface mounted to and rotatable with said rotor;

a non-rotating second seal member presenting an annular sealing surface mounted to the tubular carrier member for axial movement within the housing between an unpressurized position wherein said second seal member is spaced apart from said first seal member and a pressurized position wherein said first and said second seal members are structurally arranged to provide a seal between the annular sealing surfaces of said rotating and said non-rotating seal members; and

wherein at least one of the annular sealing surfaces presented by said rotating seal member and said non-rotating seal member is chamfered such that the width of one of said annular sealing surfaces is less than the width of said other annular sealing surface.

7. The coolant union in accordance with claim 6, wherein the width of said chamfered sealing surface provides a sealing surface of approximately one-half the width of said other sealing surface.

5 8. The coolant union in accordance with claim 6, wherein each of said first and said second seal members have different porosity values for absorbing the fluid coolant to provide self-lubrication and resistance to dry running conditions of the coolant union.

9. The coolant union in accordance with claim 6, wherein said second seal member is chamfered and said first seal member is unchamfered.

10 10. The coolant union in accordance with claim 6, wherein said coolant union further includes a secondary seal assembly for preventing coolant leakage forwardly through the gap between the carrier member and the inner wall of the union housing.

15 11. The fluid coolant union in accordance with claim 6, wherein said secondary seal assembly includes a U-shaped annular seal member positioned in an annular groove positioned in the housing wall defining a cylindrical chamber, with said U-shaped seal member having a chamfered surface substantially engageable with the gap between the carrier member and the inner wall of the union housing, with said chamfered portion of said U-shaped annular seal member being structurally arranged to engage a back-up ring positioned adjacent said gap to provide an unfilled volume and relative displacement of said floating seal assembly to thereby create the separation between said rotating and said non-rotating seal members of the seal  
20 assembly from each other when the first and second seal members are unpressurized.

12. The coolant union in accordance with claim 6, wherein said back-up ring is triangular shaped and includes a surface which is structurally arranged to cooperate with said chamfered surface on said U-shaped seal member.